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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/506,764	12/27/2004	William M. Golberger	0626-015.03	8914

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SUITE 2850
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CHICAGO, IL 60606

EXAMINER	
YANG, JIE	

ART UNIT	PAPER NUMBER
1742	

MAIL DATE	DELIVERY MODE
09/28/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/506,764	GOLBERGER ET AL.	
	Examiner	Art Unit	
	Jie Yang	1742	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *17 September 2007*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-39* is/are pending in the application.

4a) Of the above claim(s) *17,35 to 39* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-16 and 18-34* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *08 September 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *11/26/2004*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Priority

Provisional application No. 60/365,676, filed on Mar. 19, 2002.

Election/Restrictions

Applicant's election of "Group I (Claims 1-16 and 18-34)—producing method" in the reply filed on 9/17/2007 is acknowledged without traverse (MPEP 818.03(a)).

Claims 17, 35-39 are withdrawn from consideration as being directed to a non-elected group and claims 1-16, and 18-34 are pending for examination.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 18-20, 23-27, 31 are rejected under 35 U.S.C. 102(b) as anticipated by Tomizawa et al (US 4,224,056, thereafter '056).

Regard to claim 18, '056 teaches a process for reducing the iron ores with a fluidized bed system and more particularly a process for reducing the iron ores while simultaneously producing the reducing gas (Col.1, line 7-10 of '056). '056 teaches materials include the fine ore solids (iron ores,

pellets and so on) (Col.1, line 19-29 of '056) and fine carbon bearing particles (Col.2, line 3-9 of '056). '056 teaches a fluidized bed A (Fig. 7 of '056) of the fine carbon bearing particles are heated by electrodes and the fine ore solids descend through the fluidized bed (Col.5, line 56 to Col.6, line 33 of '056). '056 teaches a gas at such a rate of flow as for sustaining a fluidized bed in the reactor is introduced through a gas inlet into a fluidized bed portion (Col.3 line 21-28; Col.4, line 1-8 of '056) and '056 teaches controlling the content of the fluidizing gases circulated through the reactor (Col.5, line 1-11, claims 6-7 of '056). '056 teaches a fluidizing bed process further comprising the step of controlling the reactor temperature (Claims 4, 8 of '056). '056 further teaches the reduced iron ores are discharged to the exterior and the exhaust gas flows through a gas circulation line (Col.3, line 60 to Col.4 line 8, and claim 9 of '056).

Regard to claims 19-20, '056 teaches the fine ore solids (Fe_2O_3) reacted with carbon monoxide (CO) or the gaseous reductant in the fluidizing and reducing gas at an elevated temperature so that iron (Fe) and carbon dioxide (CO_2) are produced (Col.4, line 27-50 of '056).

Regard to claim 23, '056 teaches the fine ore solids and the fine carbon bearing particles may be automatically and

roughly separated from each other so that only the reduced or metallized iron ores may be discharged out of the reactor. The reduced iron ores may discharged to the exterior in different manners (Col.5, line 21-54 of '056).

Regard to claims 24-26, '056 teaches the heated gaseous reducing atmosphere is formed by supplying at least one gas selected from the group consisting of air, oxygen, nitrogen, carbon monoxide, hydrogen and methane to said reactor (Claim 6 of '056). '056 further teaches The exhaust gas consisting of reducing gas or carbon monoxide (CO), carbon dioxide (CO.sub.2) and other gases and entrained solids is discharged through an exhaust gas outlet at the top of the reaction vessel and is introduced into a scrubber or dust separator. After the entrained solids have been separated in the dust separator, the exhaust gas flows through a gas circulation line into a heater. After the gas is heated to a desired temperature, it is charged through the gas charging inlet into the reactor (Col.3, line 60 to Col. 4, line 8)

Regard to claim 27, '056 teaches method for generating fine carbon bearing particles, for example, by partial combustion of coal (Col.11, line 60-68 of '056).

Regard to claim 31, because '056 teaches the fine carbon bearing particles or their equivalent are made to float in the

reducing gas or atmosphere (Col.12 line 43-48 of '056); and the fine carbon bearing particles are fluidized by the fluidizing gas so as to form the fluidized bed (Col.2, line 3-9), the pressure within the fluidized bed is approximately equal to atmospheric pressure as recited in instant claims.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claims 1-10, 14, 16, 21-22, and 32-33 are rejected under 35 U.S.C. 103(a) as being unpatentable over '056 in view of Fujioka et al (US 6,312,501, thereafter '501)

Regard to claim 1, which has the similar limitations as claim 18. The difference between claim 1 and claim 18 is the claim 1 has the limitation "forming pellets of the fine

particles of metal oxide with particulate carbon prior to introduction into the heated fluidized bed". '056 does not explicitly teach this limitation. '501 teaches a method of producing raw material pellets, including forming pellets from a mixture of an iron oxide powder, a coal powder and a binder material after adding adjusting water to the mixture, and drying the pellets, wherein the binder material comprises at least one of tar and at least one of carboxymethylcellulose and polyvinylalcohol (Abstract of '501). '501 teaches forming pellets of the fine particles of metal oxide with particulate carbon prior to direct reducing (Claim 1 and table 1 of '501). '501 teaches similar pellet making process for direct reducing process (Col.1; line 19 to Col.2, line 33, and Fig. 15-16 of '501). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention was made to forming pellets of the fine particles of metal oxide with particulate carbon prior to introduction into the heated fluidized bed as demonstrated in '501 in process of '056 to improve mechanical strength such as the falling strength of dried raw material pellets (Col.8, line 56-65 of '501).

Regard to claims 2, 3, 6-10, 16, which depended on the claim 1 and have same limitations as the claims 19, 20, 23-27,

and 31, separately. '056 teaches these limitations as discussed in the rejections for the claims 19, 20, 23-27, and 31.

Regard to claim 32, which depended on the claim 18. The claim 1 includes the limitations of the claims 18 and 32. As '056 and '501 teach the limitations of claim 1 as discussed above, the claim 32 is rendered obvious by '056 and '501.

Regard to claims 4-5, 21-22, '056 does not explicitly teach actually operation temperature and time for the fluidized bed. '501 teaches high temperature reduced process temperature range from 800°C to 1200°C for 3 to 30 min (Col.14, line 61-67 of '501). These temperature and time period ranges overlap the temperature and time period ranges recited in the instant claims. See MPEP 2144.05 I.

Regard claims 14 and 33, '056 does not explicitly teach particulate carbon in the pellets is from 22.5 wt.% to 28 wt.% of the metallic oxide. However, '501 teaches iron ore powder mixing with coal powder and other carbon including materials to form pellets, and the iron ore in percentage from 65 wt.% to 80wt.% (Abstract and table 1 of '501).

Claims 11-13, 15, 28-30, 34 are rejected under 35 U.S.C. 103(a) as being unpatentable over '056 in view of '501 and further evidenced by prior arts Milionis (US 4,720,299, thereafter '299) and Oberndorfer et al (US 5,676,734, thereafter '734)

Regard to claims 11-13,15, 28-30, and 34, the size of granular carbon, metallic oxide, particulate carbon, and formed pellet are recognized as a result-effective variable in terms of effecting iron ore reduction process. This is evidenced by prior arts Milionis (US 4,720,299, thereafter '299) and Oberndorfer et al (US 5,676,734, thereafter '734). '299 teaches direct reduction iron ore process with particle size 0.2-1 mm (Claims 1 and 6 of '299) and '734 teaches method of treating fine ore with dust ore particles having grain dimensions smaller than 150 μm (Claim 16 of '734). It would have been obvious to one skill in the art to optimize the size of above powders and pellets in the process of '056 in view of '501 and further in view of '299 and '734 in order to obtain the desired reduction results. See MPEP 2144.05 II.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jie Yang whose telephone number is 571-2701884. The examiner can normally be reached on IFP.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Roy King can be reached on 571-2721244. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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